

Phyllonorycter issikii (Lepidoptera: Gracillariidae), new to the Belgian fauna

Steve Wullaert

Abstract. On 29 October 2011, some leaf mines of *Phyllonorycter issikii* (Kumata, 1963) were found on *Tilia cordata* at Zutendaal (province of Limburg). This is the first record of this species for the Belgian fauna. Some data on the distribution and the biology are presented.

Samenvatting. *Phyllonorycter issikii* (Lepidoptera: Gracillariidae), nieuw voor de Belgische fauna
Op 29.x.2011 werden op het domein De Lieteberg, Zutendaal (prov. Limburg) enkele bladmine van *Phyllonorycter issikii* (Kumata, 1963) verzameld. Dit is de eerste melding van deze soort voor de Belgische fauna. Gegevens over de verspreiding en de biologie worden meegeedeeld.

Résumé. *Phyllonorycter issikii* (Lepidoptera: Gracillariidae), espèce nouvelle pour la faune belge
Le 29 octobre 2011 quelques mines de *Phyllonorycter issikii* (Kumata, 1963) ont été trouvées à Zutendaal (Limburg). Il s'agit d'une espèce nouvelle pour la faune belge. Des informations concernant la distribution et la biologie de cette espèce sont présentées.

Key words: *Phyllonorycter issikii* – Faunistics – First record – Belgium.

Wullaert, S.: Vaartstraat 18, B-8710 Wielsbeke, Belgium. sw.demijnen@gmail.com

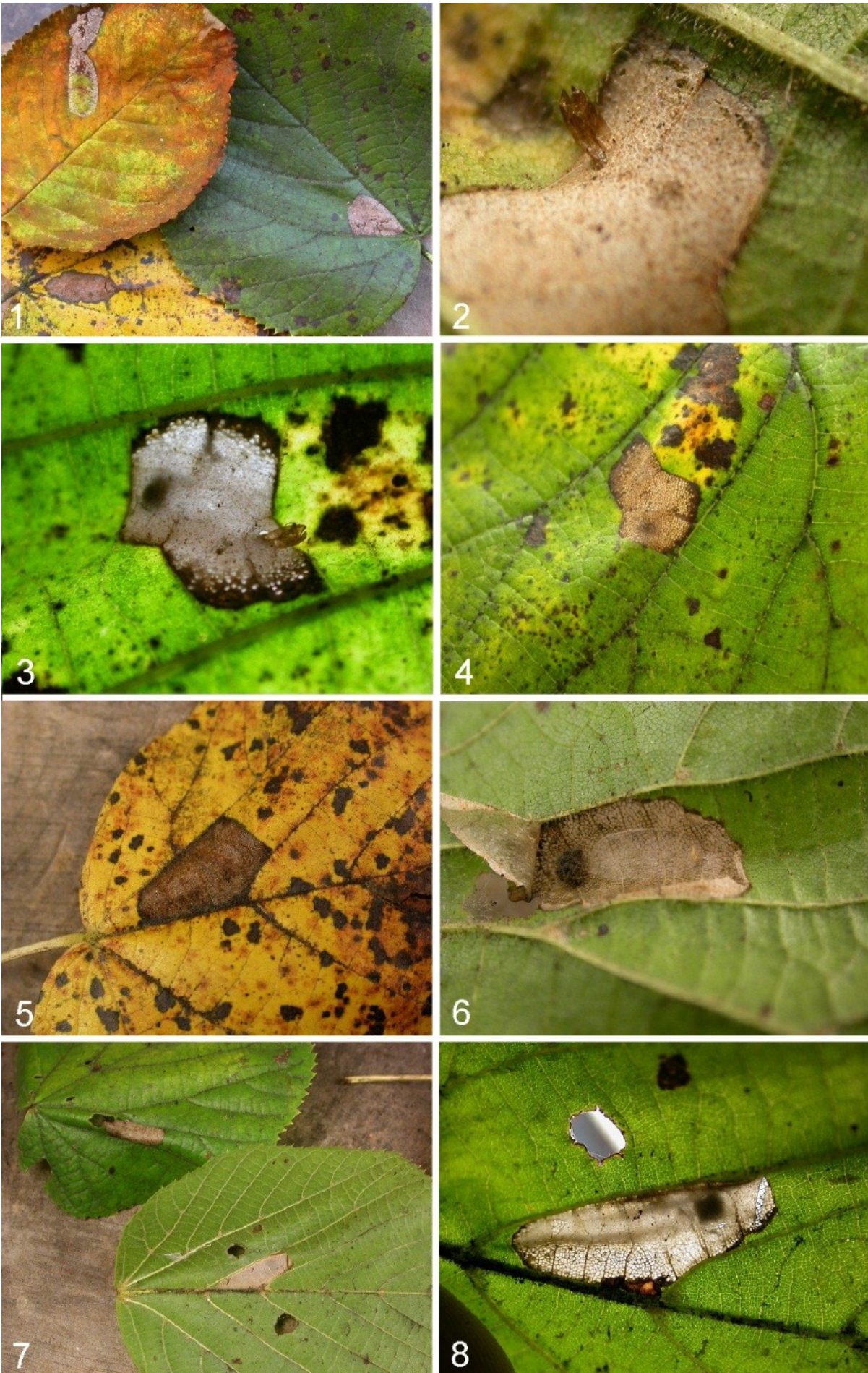
Introduction

2011 was an interesting year for the leaf miners workgroup. We made 23 excursions that year. A lot of those excursions were in autumn, especially because leaf mines are more abundant in that period of the year. The weekend of 29 and 30 October we made two different excursions, one on Saturday the 29th, where we went to Ham and to Zutendaal (province of Limburg). The 30th we visited several places in Antwerp and East-Flanders. Three years of searching with our leaf miners workgroup was finally rewarded! On the domain Lieteberg we found several mines of *Phyllonorycter issikii* (Kumata, 1963) on *Tilia cordata*. All the mines were vacated and some of them had a pupa sticking out of the under epidermis (Figs. 2, 3). It was very likely to expect the species in Belgium near the German or Dutch border, because the species was expanding its range westwards, coming from the east over Germany to Holland and now into Belgium. In Europe there are 151 different species in the genus *Phyllonorycter* Hübner 1822, family Gracillariidae (Buszko 2012), of which 59 are present in Belgium (De Prins & Steeman 2012). With *Phyllonorycter issikii* we reach 60 species within the genus *Phyllonorycter*.

Biology

The larva makes rather large elliptical lower-surface tentiform mines between two veins, almost without any folds in the epidermis (Figs. 2, 3). Often there are several mines on one leaf. Leaves with numerous mines are deformed. The average number of mines can reach 4 to 6 mines per leaf, but a maximum of 27 mines per leaf has already been observed (Kozlov 1991, Orlinskii *et al.* 1991). The frass within the mine is concentrated in a

corner; when the leaf is held towards a light source the pile of black frass is clearly visible (Figs. 3, 8). Early mines are very difficult to detect. When the larva reaches the 4th and 5th instar, the mines are clearly visible to the eye. The 5th instar larva eats out little islands in the palisade parenchyma so that whitish dots are seen on the upper side of the mine (Šefrová 2002). The females lay their eggs on leaves situated in the shadow (Noreika 1998). They usually prefer to select the lower branches or the undergrowth (Šefrová 2002). *Phyllonorycter issikii* feeds in their native area on *Tilia maximowicziana*, *T. kiussiana*, *T. japonica* (in Japan), *T. amurensis* (far eastern Russia) and *T. mandshurica* (in Korea) (De Prins & De Prins 2012). In Europe it feeds on *T. cordata* and *T. platyphyllos* but also on their crosses, such as *Tilia x euchlora* and *x vulgaris* (Noreika 1998, Lees 2010). The adults fly in two generations: at the end of April and May and again in August and September (Noreika 1998) whereby the 2nd generation adults hibernate (Šefrová 2002). Hibernating adults are to be found in the bark slots, crevices under bark and in other shelters (Šefrová 2003). In the North the first generation is found much later, probably because of colder weather during spring (Bengtsson 2011). Habited mines can be found in May until half June and again from the end of July until the end of September (Schreurs & Muus 2009). The adults are seasonally dimorphic, there is a aestival form and an autumnal form. The aestival or spring form is orange brown with certain dark costal and dorsal shades, while the autumnal form is much darker. The forewing is covered with black, dark beige and white scales, making the moth mottled (Bengtsson 2011). This striking habitual seasonal difference is possibly due to the fact that the hibernating adults easily escape the attention of their predators in overwintering shelters (Šefrová 2002).



Figs. 1–8. *Phyllonorycter issikii* (Kumata, 1963) mines on *Tilia cordata*. Zutendaal, (Belgium, Limburg), 29.x.2011, leg. Leaf miners group, (photos 1–4 S. Wullaert, photos 5–8 C. Snyers).

Distribution

Phyllonorycter issikii was originally described from Japan, on the island of Hokkaido by Kumata in 1963 and it was found later on some other islands of Japan and in Korea and eastern China. It seems that the species was introduced during the 1980s into Moscow or other towns of the European part of the USSR, since then the species is spreading westwards (Šefrová 2002). From 1996 onwards the species spread rapidly throughout eastern Europe; it was found in the same year in south-eastern Poland, in 1997 in Lithuania (Bengtsson 2011) and in Belarus and Latvia in 1998 (Buszko *et al.* 2000, Buszko & Nowacki 2000). In 2000 the first mines in the Czech and Slovak Republics were found (Šefrová *et al.* 2000) but also in northern Austria and northern Hungary (Šefrová 2002). In 2001 the species reached eastern Germany (Graf *et al.* 2002). In 2002 it was found in Finland. And in 2003 it was found for the first time in Estland (Bengtsson 2011). From 2005 on the species had spread well into parts of middle and western Germany: in Bayern, Furth im Wald (2005); in Rheinland-Pfalz, Ober-Olmer Wald (2006); in Thüringen, Weimar-Waldstadt (2008)

(Lepiforum 2012). In 2007 the species reached the north-eastern part of France (Reinhardt & Rennwald 2008). In 2009 the species was found for the first time in the Benelux. In Posterholt (The Netherlands), Arnold Schreurs en Martien van Stiphout found the first mines on 21st September 2009 (Schreurs & Muus 2009). Posterholt is a village very close to the Belgium border, so Belgium was the logical following country where the species occurred and it is presumable that *Phyllonorycter issikii* will spread further into Europe during the following years. Larger countries like Spain, Portugal, Great-Britain, Norway and Sweden are still missing the species (Buszko 2012).

Acknowledgements

I would like to thank Dries De Vreeze and Chris Snyers who accompanied me during the excursions, Raymond Lambie who provided the permission to make inventories in Lieteberg, and the whole team of volunteers working at the domain Lieteberg. Also I would like to thank Willy De Prins who commented upon this paper.

References

- Bengtsson B. Å., Johansson R. & Palmqvist G. 2011. *Nationalnyckelen till Sveriges flora och fauna. Fjärilar: Bronsmalar – rullvingemalar. Lepidoptera: Roeslerstammiidae – Lyonetidae.* — ArtDatabanken, SLU, Uppsala.
- Buszko J. 2012. *Fauna Europaea: Gracillariidae.* — In: Karsholt O. & van Nieukerken, E. J. (eds.) *Lepidoptera, Moths, Fauna Europaea version 2.4*, www.faunaeur.org (accessed on 25 April 2012).
- Buszko J. & Nowacki J. 2000. The Lepidoptera of Poland. A distributional checklist. — *Polish entomological Monographs* **1**: 1–178.
- Buszko J., Šefrová H. & Laštůvka Z. 2000. *Invasive species of Lithocolletinae in Europe and their spreading (Gracillariidae)*, p. 22–23. XII European Congress of Lepidopterology SEL, Programma and Abstracts. Bialowieza (Poland) 29 May – 2 June 2000, 91pp.
- De Prins W. & Steeman C. 2011. *Catalogue of the Lepidoptera of Belgium.* — www.phegea.org (accessed on 25 April 2012).
- De Prins J. & De Prins W. *Global taxonomic database of Gracillariidae (Lepidoptera).* — www.gracillariidae.net (accessed on 27 April 2012).
- Graf F., Leutsch H., Nuss M., Stübner A. & Walter S. 2002. Aktuelle Daten zur Kleinschmetterlingsfauna von Sachsen mit Hinweisen zu anderen Bundesländern (Lep.). III. — *Entomologische Nachrichten und Berichte* **46**: 99–104.
- Kozlov M. V. 1991. Leaf miner moth – a pest of lime. — *Zashchita Rastenii* **11**: 46.
- Lees D. 2010. *Phyllonorycter issikii.* — In: Roques A. & Lees D. (Eds.) *Biorisk* **4**(2): 855–1021.
- Lepiforum 2012. *Bestimmungshilfe für die in Europa nachgewiesenen Schmetterlingsarten.* — www.lepiforum.de (accessed on 25 April 2012).
- Noreika R. 1998. *Phyllonorycter issikii* (Kumata, 1963) in Lithuania. — *Acta Zoologica Lituanica. Entomologia* **8**(3): 34–37.
- Orlinskii A. D., Shaharamanov I. K., Muhanov S. J. & Masliakov V. Y. 1991. Potential quarantine forest pests in the USSR. — *Zashchita Rastenii* **11**: 37–42.
- Reinhardt R. & Rennwald E. 2008. *Phyllonorycter issikii* (Kumata, 1963) jetzt auch in Sachsen-Anhalt – mit einem Überblick über den gegenwärtigen Stand der Arealerweiterung in Deutschland (Lepidoptera: Gracillariidae). — *Entomologische Nachrichten und Berichte* **51**: 233.
- Schreurs A. & Muus T. 2012. De lindevouwmijnmot, *Phyllonorycter issikii*, ook in Nederland. — www.microlepidoptera.nl (accessed on 25 April 2012).
- Šefrová H., Laštůvka A. & Petrů M. 2000. Faunistic records from the Czech Republic – 122. Lepidoptera: Gracillariidae. — *Klapalekiana* **36**(4): 326.
- Šefrová H. 2002. *Phyllonorycter issikii* (Kumata, 1963) – Bionomics, ecological impact and spread in Europe – *Acta universitatis agriculturae et silviculturae. Mendel. Brun.*, **50**(3): 99–104.
- Šefrová H. 2003. Invasions of Lithocolletinae species in Europe – causes, kinds, limits and ecological impact (Lepidoptera, Gracillariidae). — *Ekológia, Bratislava* **22**(2): 132–142.